DOCUMENT RESUME

ED 323 695 EC 232 123

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TITLE Physical Education for Students with Special Needs. Curriculum Support Series.
INSTITUTION Manitoba Dept. of Education and Training, Winnipeg.
REPORT NO ISBN-0-7711-0794-3
PUB DATE Jan 89
NOTE 78p.
PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Assistive Devices (for Disabled); Classroom Environment; Classroom Techniques; *Disabilities; Elementary Secondary Education; Evaluation Methods; Foreign Countries; Individualized Instruction; *Mainstreaming; Movement Education; *Physical Education; Program Development; Student Characteristics; *Teaching Methods
IDENTIFIERS Manitoba

ABSTRACT

The guide is intended to assist Manitoba physical education teachers in the process of integrating students with disabilities into regular physical education classes. The manual provides an introduction to students with special needs, stresses the need to create an accepting environment, discusses various teaching tips, and highlights resources available to teachers. Part 1 presents a discussion of human movement including "learning to move," the role of practice, and "moving to learn." Part 2 presents descriptive information and specific hints for physical activity programming for the following disabilities: asthma, visual impairments, cerebral palsy, deafness and hearing impairment, diabetes, convulsive disorders, physical awkwardness, mental retardation, Down Syndrome, autism, muscular dystrophy, obesity, and spina bifida. Part 3 provides principles for creating an accepting environment including information on mainstreaming as a continuum of participation, teacher attitudes, creating peer acceptance, and eliminating environmental barriers. Part 4 offers teaching tips in the areas of assessment, task analysis, behavioral teaching principles, activity analysis, and activity modification/adaptation. Part 5 describes additional resources including screening tests, checklists, and evaluation instruments; forms; modified equipment (e.g., aquatic devices, bicycling equipment, devices for ball activities); adaptive equipment; and materials suppliers. The bibliography contains 40 references. (DB)

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PHYSICAL EDUCATION

FOR

STUDENTS WITH SPECIAL NEEDS

January 1989

Michael J. Mahon
University of Manitoba

ISBN 0 - 7711 - 0794 - 3

ACKNOWLEDGMENTS

Manitoba Education and Training wishes to express its appreciation to Michael J. Mahon of the Faculty of Physical Education and Recreation Studies, University of Manitoba, for his efforts in developing this support document.

The author would like to extend his thanks to the following people for their astute comments on early drafts of this document:

Maureen Dowds, B.P.E. - Manitoba Special Olympics
Leona Johnson, M.Ed. - Manitoba Special Olympics
Dick LaPage - Manitoba Education
Marilyn VanWallingham, M.Sc. - Wpg. School Div. #1/ Cerebral Palsy Sports Ass.
Greg Reid, Ph.D. - Department of Physical Education, McGill University

Manitoba Education and Training would also like to express appreciation to the following for their permission to reprint certain material within this document:

Canadian Special Olympics - For Figures 1 and 2 taken from the Canadian Special Olympics Level 1 Technical Manual.
Charles C. Bullock, University of North Carolina - For information taken from the Community Reintegration Program: Facilitator's Guide.
Winnipeg School Division #1 - For the Basic Movement Skills Observation Profile.

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INTRODUCTION

The intent of a curriculum support series is to provide resource material, in addition to the existing curriculum, which will assist teachers in providing instruction for all students. This document has been developed as a support document to the K-12 Physical Education curriculum. It is hoped that physical education teachers will be able to utilize the information to provide quality physical education programming for all students with special needs.

The aim of any physical education program is:

> **to help students develop and participate in a purposeful, physically active lifestyle, which will enable them to experience a more enjoyable quality of life - today and tomorrow.**

It is the responsibility of physical education teachers in Manitoba to ensure that all students are given the chance to participate in a meaningful program which matches this definition. Physical education is an integral part of the education process.

This support document is intended to assist physical education teachers in the process of integrating students who are disabled into regular physical education classes. It has been developed in keeping with a philosophy which adheres to the following beliefs:

- Each student is unique. This uniqueness must be respected, and the physical education program must be structured to meet individual needs.
- Each student has the right to both succeed and fail in experiences in a physical education class.
- Each student must be given the chance to achieve his or her potential in physical activity. There must be an open relationship between teacher, student and parent if this is to occur.

- Each student has the right to participate in a physical education program in an environment which is the least restrictive and which promotes a physically active lifestyle.

Instruction in physical education should be adapted to the individual needs, abilities and interests of the student. In keeping with this approach, this document will focus on teaching the individual who requires special attention. The concept of creating program adaptations will be a common thread throughout this document. The specific objectives of this manual are to :

1. Introduce teachers to a cross section of students with special needs.
2. Identify the need for creating an accepting environment.
3. Discuss various teaching tips.
4. Highlight resources available to teachers.

This document is addressed to the physical education specialist, classroom teacher, special educator and administrator. It is not intended to be an exhaustive resource. The material is intended to help teachers understand that teaching physical education to students with special needs is simply an extension of teaching and does not necessitate new earth-shattering teaching methods. Hopefully it will show that teaching physical education to students with special needs can be both fun and challenging.

PHYSICAL EDUCATION
FOR STUDENTS WITH SPECIAL NEEDS

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PART 1

THE IMPORTANCE OF HUMAN MOVEMENT

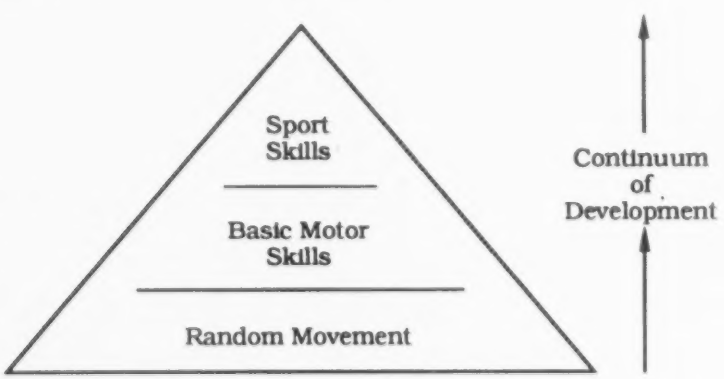
Movement plays a vital role in the overall development of all human beings. From as early as a newborn's first grasp or a toddler's first steps, movement is a way that individuals discover and explore their environment.

The role of movement in child development can be viewed as twofold: children learn to move and move to learn. These two ingredients -- learning to move and moving to learn -- are key to the development of movement in children.

LEARNING TO MOVE

The concept of "learning to move" is a part of a traditional view of movement development that involves identifying progressive stages of that development. All students move through approximately the same sequence of development, from reflexive to voluntary, simple to complex. The triangle in Figure 1 depicts this sequence of development.

Figure 1: Sequence of Motor Skill Development



The fundamental purpose of ensuring that appropriate motor development occurs is to prepare individuals to meet the increasing demands of their environment as efficiently as possible. It has been well documented that as children grow they are faced with ever increasing demands in the activities in which they are expected to participate (Wall, 1983). A child's ability to deal with these demands depends very much on his or her ability to use higher level motor patterns in conjunction with the many rules often associated with these motor patterns. These are known as cognitive motor skills. Success is largely dependent on the amount of practice a child is able to have.

In the past it was assumed that all school-aged children are afforded an adequate amount of practice time during play. This belief has recently been refuted on two counts:

1. The concept of practice does not refer to "any" time spent engaged in an activity but refers specifically to practice that facilitates the development of skillful performance. Time spent practicing a movement the "wrong way" is not useful practice time. This emphasizes the need for structured physical education experiences.
2. Although some students do learn proper movement patterns through trial and error and practice in an unstructured play environment, other students require a far more structured environment to ensure that learning is taking place (Watkinson and Wall, 1982). This makes clear the need for individual instruction.

It is important to recognize that the basic motor skills a student possesses will become the base for more complex sport skills later on in the school years. If motor skills are not properly developed, the student will encounter many problems. Some of these may be:

1. **As the students grow older, their opportunity for movement becomes limited.**
2. **Students tend to be negative towards the individual with inefficient motor skills. This may lead to negative effects on the self-esteem of the special needs student.**
3. **Students may have a fear of performing skills unsuccessfully, thus their practice may be limited, or worse, they may give up participating entirely.**
4. **Incorrect motor patterns become habits that are difficult to break.**

(McClenaghan, Date)

Teachers must recognize that individuals who are disabled generally fit into two groups:

1. those who have a specific deficit,
2. those who exhibit some degree of delay.

The group to which a student belongs will play an important part in determining the type of activities in which he or she becomes involved. Individuals with some sort of deficit benefit from support and access which help compensate for their disability. For example, a student who has had one leg amputated requires assistance in coping in a gym program as a result of being in a wheelchair or having a prosthesis. Specific information regarding particular disabilities will be discussed in Part 2 of this document.

In comparison, a student who exhibits some degree of developmental delay -- for example, a student who is mentally handicapped -- does not require apparatus fundamentally different from that used by non-disabled students. They simply require more individualized instruction which focuses on the developmental level they have reached with respect to motor skills. No matter what the rate or extent of progress, the principles of development will remain the same, and the individual will progress at his/her own rate. Individuals who are disabled progress through the same stages of motor development outlined in Figure 1.

The development of basic motor skills for any student who is disabled can be enhanced by providing opportunities for practice at the individual's ability level.

Development through Practice

The best way to develop basic motor skills is through practice. The more movement experience which an individual can have, the more practice that individual will get, and the better his or her skills will become. It is important to recognize that it is not only the quantity of practice time but also the quality of the practice time which makes the difference. Practicing errors only reinforces errors.

Quality practice can be achieved through many forms. Some of the ways a teacher can ensure that quality practice time occurs are:

1. *Stations* - During a class, students can take advantage of stations which focus on different motor skills and offer varying levels of difficulty. The Step-by-Step Program (Winnipeg School Division #1, 1988) provides a wealth of ideas for motor skill stations.
2. *Free Play* - Students shall be provided with time during class in which they can play and explore freely. These free play times are perfect opportunities for teachers to watch children in their class who are disabled. This means of informal assessment can provide many ideas for remedial instruction.
3. *Low Organized Games* - Games which involve simple motor skills rather than more complex sport skills can benefit those students who require extra practice time for motor skill development. Again the Step-by-Step program provides many ideas in this area.
4. *Relays* - All students love a relay game. By using relays which focus on simple locomotor skills teachers can challenge more skilled students, while at the same time providing needed practice time for the students with special needs.

5. *Lunch Hour/After School Remedial Work* - It is an accepted practice for students who are having trouble with Math to stay in at lunch or after school for extra help. This same attitude would be helpful for students needing extra practice related to motor skills. These times can be tailor made for teachers to work with such students.

Work at the Individual's Level

In all situations, teachers should consider the individual stages of basic motor skill development before introducing any type of program. The skill which a student attempts should correspond to his or her developmental level.

MOVING TO LEARN

A second way that movement and its importance can be considered is the concept of moving to learn. It is important to recognize that structured movement programs can provide experiences and opportunities to gain information and engage in personal social interactions (Keogh, 1983). Movement experiences in this view are a means to an end or are an environment for learning. Information is gathered in by students, as their movement takes them to different locations and involves different equipment. During these movement experiences, personal social interactions take place between the teacher and other students. These movement opportunities can provide natural times for the social integration of a variety of students. Students involved in these active learning experiences are indeed moving to learn.

Recognition of the fact that a physical education program can serve the two functions previously discussed will ensure that the program accommodates the physical, social and psychological development of students.

PART 2

THE STUDENT WITH SPECIAL NEEDS

This section is intended to introduce teachers to the disabling conditions which may affect students who are in their physical education classes. It is important to recognize that students with such conditions are "people" first and individuals with disabilities second. Many students may be affected by the same disabling condition. This does not mean that they can all be treated in exactly the same way. Teachers are faced with what has been termed the "paradox of labels" (Kennedy, Austin, and Smith, 1987). There are shortcomings to labeling individuals by disabilities; for example, the mentally handicapped. On the other hand it is necessary for teachers to be aware of the condition which may affect a student's performance so that they are able to ensure that the individual's needs can be met in the gymnasium. Labels, then, should be used not to restrict development but rather to enhance it. This section is meant to identify characteristics related to some disabling conditions. It is not meant as a means of labelling to categorize students. It is important to view all terminology as a guide to effective programming.

The section also deals with the implications of these various types of disabilities for physical activity. This section is not meant to provide you with all the answers but to start you thinking. The following statement is an important premise to keep in mind with respect to all disabilities:

> **Students who have a disability can participate in many of the same activities as non-disabled students provided that they have learned basic motor skills, possess minimal levels of physical fitness, and have had some opportunities for interesting movement experiences.**
>
> **(Eichstaedt and Kalakian, 1987)**

ASTHMA

Asthma is a chronic lung disease. Management of this disease is largely dependent upon medication and avoidance of certain stimuli that trigger the attacks. An attack is characterized by spasms of the bronchial tubes, (key areas within the lungs), swelling of their linings, and excessive secretion of mucus. All of these cause coughing, wheezing, dyspnea (breathing difficulty), and a feeling of constriction in the chest.

A classic asthmatic attack will progress through three stages: 1) coughing, 2) dyspnea, and 3) severe bronchial obstruction. The third stage should be prevented whenever possible by medication, stoppage of exercise, or removal of allergens.

Research in the last number of years which has looked at exercise-induced asthma (EIA) has found:

- Short-term exercise, less than 4 minutes facilitates breathing,
- Long-term exercise causes bronchoconstriction.

Screening should be done to determine whether students fall in the EIA class. If they do, medication can be prescribed which will prevent or reduce EIA.

Implications/ Hints for Physical Activity Programming

- Students with EIA should participate in strenuous physical activity as long as they have the proper medication.
- Warming up before exercise will reduce the onset of EIA.
- Certain activities are better for the student with EIA. For example: sprints rather than long distance running, games like baseball or volleyball rather than soccer or hockey which demand continuous movement.
- The most widely accepted principle for EIA students is **Intermittent Exercise** - no more than 5 minutes of hard activity, followed by 5 minutes of rest.
- Modification of activities should be done in concert with teachers, parents, physician and the student.

- Many students with asthma will have very low fitness levels because of fear and lack of expectations. Teachers must be sensitive to this and slowly introduce more strenuous activities with these students.
- Teachers should be aware that certain aspects of the environment, such as dust and pollens, will cause the onset of an attack. Students may have to remain indoors during the peak seasons for these attacks.
- Alterations in body temperature, specifically overheating, can cause wheezing. A cold, wet towel on the head and neck between activities will reduce the chance of this.
- Water **must** be taken in regularly by students with asthma. Dryness makes the mucus more thick, and thus more difficult to cough up.

VISUAL IMPAIRMENTS

Visual impairment is one of the most well known disabilities; however, it is less known that, of those who are visually impaired, only a small percentage of individuals have absolutely no vision. The remaining have some visual acuity, ranging from the ability to read large print to the ability to distinguish light from dark. There are three general categories covered under the term visual impairment:

Blind --	Complete loss of sight.
Legally Blind --	Visual acuity that does not exceed 20/200 in the *better eye* with corrective lenses or a visual field of less than a 20-degree visual angle.
Partially Sighted --	Visual acuity better than 20/200 but does not exceed 20/70 in the better eye after correction. These individuals may have very good functional vision but may be unable to read a newspaper or see a television image.

Implications/ Hints for Physical Activity Programming

There is no evidence to suggest that blind and partially sighted people are any more likely to have an accident at a recreation facility than their sighted peers, provided that sensible precautions are taken. For example:

Corridors and passage ways should be kept clear.

Contrasting colors can assist partially sighted people.

Top and bottom steps should be clearly marked.

Some hints for physical activity programming are:

- Introduce the student to classmates. Allow other students to ask the student who is visually impaired questions about the disability, if that student feels comfortable answering them.
- Speak in a normal voice. Demonstrate using touch.
- Familiarize the student with the immediate environment before beginning any activity. Placing equipment so that it is easily accessible and always in the same location is useful. Keep things arranged in an orderly fashion so that participants do not fall over them.
- Provide maximum lighting in order to diminish eyestrain.
- Capitalize on all remaining sensory receptors in activities. Add a bell to the ball and play circle dodge ball. Run relays in a roped off area. Adapted devices added to games and equipment can provide access to participation for persons who have visual impairments.
- Enlarge target objects. Use brightly colored objects.
- Provide the visually impaired students with one-to-one assistance from a volunteer or aid during most vigorous activities such as running. **It is very important, however, to provide some activities where the student can work alone and experience the satisfaction of individual achievement.**

CEREBRAL PALSY

Cerebral palsy is a commonly used term for a group of conditions, usually originating in childhood, that are characterized by paralysis, weakness, lack of coordination, and other losses of motor function. The condition is due to non-progressive brain damage at the pre-natal stage or shortly after birth.

Cerebral palsy often has associated disorders. Mental retardation, a condition which will be discussed later, is prevalent in an estimated 60 to 70 percent of persons diagnosed as having cerebral palsy. Convulsive disorders and speech disorders are other conditions often associated with this condition. The main types of cerebral palsy are:

- *Spastic* - One or more parts of the body may be involved. Often characterized by abnormal posture while lying, sitting, standing, and walking. Voluntary movement is present but rather laboured, jerky or exaggerated rather than smoothly coordinated.
- *Athetoid* - Irregular, uncontrollable, involuntary motions occur in any part of the body, including the face and tongue. Coordination is difficult when voluntary movement is attempted. Poor fine hand movement is also evident.
- *Ataxic* - A disturbance of balance and sense of direction is involved in ataxic cerebral palsy. Voluntary movements are present but may be clumsy and uncoordinated. Nystagmus (eye jerking involuntarily) may occur.

Implications/Hints for Physical Activity Programming

- Communication can be a problem between an instructor and a student whose cerebral palsy also involves a speech defect. Patience and understanding of the frustration of the speaker will often minimize the barriers which may otherwise be created.
- Developmental and corrective exercises are necessary and can be incorporated into physical education programs for students with cerebral palsy.

- An important concept to keep in mind when setting goals for the student with spastic cerebral palsy is that proper muscle balance at affected joints must, if possible, be restored. This can be accomplished by relaxing "tight" muscles to cause contraction of the weak antagonists. The key is to work with the student so that he or she begins to understand how the muscle works, and begins to "feel" variations in tone throughout the mid range. This is not an easy thing to teach. Teachers should not feel inadequate if they find such a task too challenging.
- Relaxation exercises are very important. **See the bibliography for references relating to this area.**
- Students will be more successful at larger muscle motor skills such as running, jumping and throwing. Fine motor activities using eye-hand coordination or delicate finger movements can be frustrating. It is important to work on these more difficult skills before introducing the student to an environment in which he or she may fail continuously in front of other students.
- Balance exercises should be introduced. It is important to be aware that students may often fall as a result of a loss of balance. Do not overprotect the individual from these falls; rather, work towards diminishing their incidence through practice.
- Work towards doing the skill properly, but still allow the individual to do it the way that is most successful.

DEAFNESS AND HEARING IMPAIRMENT

Hearing impairment is the general term used to describe all types of hearing defects, ranging from a very minimal loss of hearing to profound deafness. Hearing impairment may be congenital or the result of accident or illness. Special educators often distinguish between deafness and less severe levels of hearing loss by how the student learns language. Deaf students who have had little or no hearing ability during the first three years of life will not have learned language in the normal way; these students are classified as educationally deaf (prelingually deaf). Students who have become hearing impaired after three years of life will, in most cases, have learned language in the usual way.

Implications/Hints for Physical Activity Programming

- Most hearing impaired students can perform successfully in the regular, unrestricted physical education class.
- A good deal of literature has questioned whether there are any motor deficits associated with hearing impairments. From the research it seems questionable whether there is a need for any special programming in a physical education class with a student who is hearing impaired, unless observation of the student suggests otherwise.
- It is beneficial for the teacher of a hearing impaired student to learn the basics of sign language. In addition, it is a good idea to encourage students in the class to learn sign language from either the teacher or the student with the hearing impairment.
- The teacher's face should be visible to the student at all times.
- Important instructions should be given in a place close to the student.
- Many visual aids and demonstrations should be used.
- The student should be encouraged to follow the examples of other students.
- The student may have balance problems and, as a result, may have difficulty with some activities.
- The student should be encouraged to use a hearing aid if he or she has one.
- Distracting noises should be eliminated.

DIABETES

Diabetes is a disturbance resulting in insufficient insulin in the bloodstream. It occurs most frequently in persons over forty. Females are more likely to have diabetes than males. Most diabetes can be controlled by insulin injections and diet; tablets and diet; or by diet alone.

Insulin reaction or shock may be caused by skipping a meal, over exercise, or accidently injecting too much insulin. The result, hypoglycemia, can lead to convulsions similar to an epileptic seizure, or to unconsciousness. Early symptoms of insulin shock are:

a) shakiness and trembling, b) nervousness, c) nausea, d) headache, e) fatigue, f) excessive perspiration, and g) hunger. A reaction can be treated, if recognized in time by having the student drink fruit juice, carbonated drinks, or eat candy, honey or corn syrup.

Implications/ Hints for Physical Activity Programming

- Regular exercise is very important for students who are diabetic. Exercise helps to burn sugar, thereby reducing the daily insulin requirements.
- Teachers should be aware of the signs of the onset of an insulin reaction, so that it can be dealt with early in its progress.

CONVULSIVE DISORDERS

Seizure or convulsive disorder (commonly and inappropriately called epilepsy) is not a disease and is not contagious. It is in fact a common symptom of cerebral dysfunction. Forch(1973) states that the most crippling effects of these disorders are not the convulsions, the momentary loss of consciousness, or the apparent daydreaming, but the witnessing of expressions of confusion and horror on the faces of teachers and classmates.

- Unnecessary overprotection has perpetuated the belief that physical exertion is inappropriate for individuals with convulsive disorders.
- Approximately one in every fifty school age students has seizures (Eichstaedt and Kalakian, 1987).
- Seizure disorders are controlled in the vast majority of cases by medication. The condition does not usually create a handicap.
- There are different types of seizures. Each type will vary somewhat in intensity and characteristics.

Implications/Hints for Physical Activity Programming

- Teachers should be familiar with the more severe tonic/clonic type of seizure. Of importance is a knowledge of the stages of the tonic/clonic seizure and what precautions are necessary to ensure the safety of the student.
- A tonic/ clonic seizure will normally proceed through 4 stages.

  Stage 1 Aura - a warning stage which is different for each person but usually consistent for each individual.

  Stage 2 Tonic Stage - stage when continuous contractions occur

  Stage 3 Clonic Stage - stage when intermittent contractions occur

  Stage 4 Stupor coma stage - sleeping stage
- The teacher should ensure that when the seizure begins, the student is in a safe place and cannot be injured. Teachers should adhere to the following procedure:
  1. Keep hands/fingers away from student's mouth, cushion the head and loosen tight clothes around the neck.
  2. Let the seizure run its course, and have other students continue with the program so as not to draw too much attention to the student.
  3. Place student in the recovery position (partially on side) if possible in the clonic stage.
  4. Allow student ample recovery (the student will usually know when to return to activity).
  5. Disperse any onlookers to lessen intimidation.
  6. Stay with the student, if possible, and offer reassurance during the period of confusion which often follows a major attack.
  7. Notify parents/guardian.

If you notice that the seizure is inordinately long, or if an injury has been sustained during the course of a seizure, take appropriate action by contacting medical personnel.

PHYSICALLY AWKWARD CHILDREN

Students with learning disabilities have average or above average intelligence but experience difficulty in performing in one or more areas. Students who are learning disabled in the motor performance area have been most recently described as physically awkward. More specifically, physically awkward students are:

> **... students without known neuromuscular problems who fail to perform culturally normative motor skills with acceptable proficiency.**
>
> **(Wall, 1983)**

Culturally normative motor skills are skills which the majority of students of a given age are able to perform. Depending on the age, these skills range from throwing and catching to specific sports. The awkwardness syndrome, as it is sometimes labelled, is not only characterized by a lack of motor skills in play and games but often by the difficulty of mastering fine motor skills such as using a pencil, cutting with scissors and tying shoelaces.

Students who are learning disabled may also have difficulty processing verbal instructions, interpreting visual signs and markings, remembering the sequence of instructions, and relating to activity space.

Implications/Hints for Physical Activity Programming

- Instructions should be simple and given one at a time.
- Extraneous auditory and visual stimuli should be eliminated, if possible, for those students who are easily distracted.
- Multisensory cues such as pointing in the direction you are talking should be used.
- Behavior problems can arise with students who are learning disabled, usually because of their frustrations. Acceptable behavior expectations must be set. This will be discussed in depth in Part 4 of this document.

- The most important aspect of programming is to realize that basic motor skills must be present before more complex sport skills are attempted. Assessment will determine a starting point. Following assessment, a graded progression must be developed for the individual. Part 4 will discuss this further.
- Body awareness is often a problem for physically awkward students. They often do not know their right from their left. Color codes can be utilized to distinguish right from left.
- The class can be concluded with relaxation exercises to ensure that the more hyperactive students leave the gymnasium relaxed.

MENTAL RETARDATION

The American Association of Mental Deficiency states that:

> **Mental Retardation refers to the significantly subaverage intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period.**
>
> **(Grossman, 1983)**

"Subaverage intellectual functioning" refers to IQ levels of approximately 70 and below. "Adaptive Behavior" describes the degree with which individuals meet the standards and social responsibilities expected for a specific age and/or cultural group. The "developmental period" is the period of time between birth and the 18th birthday.

The degree of mental retardation varies enormously among people. Just as there are different levels within the ranges of normal intelligence, there are different levels of mental retardation. The levels and general characteristics of each level are identified in Table 1. Mental retardation is often associated with behavior problems. This topic will be dealt with in Part 4.

TABLE 1: Educational achievement among the mentally handicapped

DEGREE OF MENTAL HANDICAP	POTENTIAL FOR EDUCATIONAL ACHIEVEMENT	POTENTIAL FOR ADULT FUNCTIONING
Mildly handicapped: IQ approximately 51-65	"Educable"; capable of 3rd to 6th grade educational achievement; able to read and write and use basic mathematics	Able to be independent personally and socially; able to be self supporting frequently lose identification as retarded and blend into "normal" population
Moderately Handicapped: IQ approximately 35-60	"Trainable"; capable of kindergarten through 3rd grade achievement: typically not able to read and write	Able to be employed in unskilled occupations typically incapable of independent living
Severely Handicapped: IQ approximately 21-35	Able to acquire some self-care skills; able to talk and express self; unable to acquire any academic skills	Need permanent care from family or society; some are capable of performing simple chores under total supervision
Profoundly Handicapped: IQ approximately 20 or lower	Unable to speak; some are capable of self-ambulation but many remain bedridden throughout their lives	Incapable of any self-maintenance; require permanent nursing care

(2) Rizzo, J. V., and Suran, B.G. Special Children: An Integrative Approach. U.S.A.: Scott, Foresman and Co., 1979.

Implications/Hints for Physical Activity Programming

- The curriculum guide Towards Independence: Learning Strategies for the Trainable Mentally Handicapped (Manitoba Department of Education, 1988) provides a wealth of ideas for a structured physical education program for students who are trainable mentally handicapped.
- Part 4 provides many key ideas for working with students who are mentally handicapped.
- It is important to recognize that one aspect of mental retardation is the prevalence of developmental delay with respect to motor skill development. As a result of this students will tend to learn motor skills at a slower rate.
- Related to the last point, though students will tend to learn more slowly, they do in fact develop motor skills in the same sequence as all other students. The teacher must recognize that the principles of instruction are the same.
- Quality practice time will ensure that the motor development of a child who is mentally handicapped progresses. It is important to recognize that the child will often require a good deal of repetition to ensure the proper learning of a skill. The learning time period must be extended.
- As with students who are physically awkward, those who are mentally handicapped must begin to perfect basic motor skills before they are exposed to more complex sport skills. Programs must focus on motor skill programming before introducing sport skill instruction.
- Try to introduce only one new activity per session, or even every two sessions.
- Plan activities so that the student who is mentally handicapped can participate meaningfully along with other students in the class.
- Use simple instructions.
- Demonstration and manipulation are often required to teach a skill. This is discussed in depth in Section 4, Instructional Techniques.

DOWN SYNDROME

About 1/600 children are born with Down Syndrome. Because of the incidence of this condition, it is important for teachers to be aware of the characteristics of Down Syndrome children in order to plan safe programs that will provide the optimum benefits to them.

Students with Down Syndrome closely resemble each other in facial features and body structure. Persons with Down Syndrome generally fall into the moderately mentally handicapped range. The cause of this chromosomal abnormality is unknown.

Down Syndrome

Characteristic	Program Consideration
Physical growth abnormally slow and eases altogether at an early age	• basic motor skills at a young age to affect developmental delay • separated in Adapted Canada Fitness Award Standard
Small oral cavity and large tongue contribute to upper respiratory infections	• endurance training a problem • care must be given to dress and length of time out of doors in winter
Congenital heart disorders are common	• check medical history - any limitations? • may have to decrease workload
Circulatory system is immature	• will limit endurance capabilities
Lax ligaments and looseness of ligaments	• feet flat
17% have atlanto-axial dislocation	• very good in flexibility activities e.g.. gymnastics

Vision is often impaired	• will affect such skills as tracking, catching, throwing
Deficient in balance	• 1-3 years behind persons with same level of retardation • difficulty in performing tasks above ground level

Atlanto-axial Dislocation

Seventeen percent of all Down Syndrome individuals are affected by a progressive condition called atlanto-axial dislocation which is greater than normal mobility of the two upper cervical vertebrae. They can be susceptible to serious spinal cord injury if their necks are severely bent or jarred.

As recommended by the National Program Committee, the Canadian Special Olympics has adopted the position that "individuals with Down Syndrome be temporarily restricted from participation in certain Special Olympics programs pending examination (including x-rays with views of the neck fully extended and flexed) by a physician who has been briefed of the nature of the atlanto-axial instability."

Any student who has been found positive for atlanto-axial dislocation or who has not been x-rayed for this condition should be restricted from the following activities:

- Gymnastics
- Diving
- Pentathalon
- Butterfly stroke (aquatics)
- Diving starts in swimming
- Floor hockey
- Alpine skiing
- Soccer
- Any warm-up exercise which places stress on the neck and head

Recommendations

- Students with Down Syndrome should be ex-rayed every 2-3 years as this is a progressive condition.
- Physical education teachers should know if they have a student with Down Syndrome in their class.

AUTISM

Autism is a severely incapacitating condition that typically appears during the first three years of life. It is characterized by communication and other developmental educational problems. Some common characteristics of autism are:

- **Withdrawal from people**
- **Muteness or inability to use speech for communication**
- **Pathological resistance to change manifested by observance of ritual, excessive preoccupation with certain objects, and emotional outbursts when the common environment is threatened.**
- **Isolated areas of high-level functioning within the context of otherwise mentally and socially retarded behaviors.**

(Sherrill, 1986, p. 437)

Implications/ Hints for Physical Activity Programming

- Autistic students will generally exhibit developmental delay with respect to motor skills. Their skill development is often comparable to students who are mentally handicapped.
- One to one instruction is the most effective teaching strategy when working with students who are autistic.
- An important goal is to have students respond to stimuli that they have typically ignored or blocked out.
- Food reinforcers are used more often with autistic students than with those with any other developmental disability. The goal, however, must be to reduce these and replace them with more appropriate reinforcers.

- Behavior management techniques are the most effective approaches to instruction when working with students who are autistic. These will be discussed in Part 4.
- It is very important that teachers communicate with each other, parents, and school psychologists related to programming for autistic students. Most students will be on a behavior management program, which should be consistently applied in the home, the classroom and the gymnasium.

MUSCULAR DYSTROPHY

Muscular dystrophy is a general term that refers to numerous diseases that cause degeneration of the voluntary muscle tissues. The most severe type is the Duchenne type which affects young boys, few of whom survive to reach adulthood. There are, however, many other types which may result in the person having a very mild to a severe handicap.

The disease is usually progressive but can progress very slowly. The main difficulties experienced by the individual with less severe handicaps are in lifting heavy objects, climbing stairs, getting out of a low chair, and carrying out tasks requiring rapid movements. Those with more severe forms require the use of a wheelchair.

Implications/Hints for Physical Activity Programming

- It is very difficult to generalize about activities because of the varying effects the diseases may have.
- For those less severe forms, muscle strengthening and range of motion exercises can be important in ensuring the individual remains mobile for as long as possible.
- Those with more severe forms will tend towards quiet types of activity such as billiards, table tennis, and darts which cater to those with limited ambulation and those who may be in a wheelchair.
- It is important to remember that a student with muscular dystrophy will tend to tire easily because of weakened muscles. It is important, therefore, to avoid strenuous activities.

- Many students are confined to an electric wheelchair which enables them to get around easily with minimal physical exertion.

OBESITY

Obesity can be more disabling than the loss or disability of a body part, and as such must be considered a handicapping condition. Obesity affects 10% to 15% of school age children. Persons whose weight is over 20% of their desired body weight according to a growth chart are considered obese. These charts, however, are controversial. The most reliable measurement is a physician's clinical judgement. Obesity can be medication-induced, or caused by either endocrine or non-endocrine factors.

Implications/ Hints for Physical Activity Programming

- The obese student can be helped by a combination of diet, exercise, drugs and counselling. All must be done in concert with each other, which means that the teacher must work as part of a team which never loses sight of the child's total needs.
- Teachers must be aware of the discomfort students who are obese may experience during exercise due to their physical characteristics. For example, discomfort may arise from the:
  - Bobbing up and down of breasts, abdomen, etc., during locomotion.
  - Chafing between thighs and other skin areas.
  - Postural defects which are common in obese children and which may affect the efficiency of locomotion.
  - Retention of fluids causing swelling in ankles, breasts and wrists.
- Walking is the exercise usually prescribed for these students. The teacher's job is to make walking seem fun, so that the student begins to gain a positive outlook on physical activity.
- Students should not be excluded from regular physical education classes. They still require socialization through play.

SPINA BIFIDA

Spina bifida is a congenital deformity of the vertebrae, which in some cases causes the boney casement of the spinal cord to remain open rather than closed. The condition occurs in about 2 to 4 out of 1000 births. Damage to the spinal cord or spinal nerves as a result of the deformation causes varying degrees of paralysis and a lack of sensation below the level of damage. Although there may also be incontinence, each individual will normally have a suitable method of dealing with this lack of bowel/bladder control, and the problem should not affect their participation in physical activity.

Students with spina bifida will in all likelihood be confined to a wheelchair. This does not mean, however, that they will not be able to participate in physical activity.

Implications/Hints for Physical Activity Programming

- It is important to know the extent of the spinal cord injury for each student with the condition.
- Progressive resistance upper extremity exercises are important to increase the strength and endurance of the student. Remember that initially he or she will tend to fatigue quickly and should not be pushed too hard.
- The teacher should watch for falls since sense of balance is often uneven.
- Braces will enhance the ability to participate but may slow movement.
- There is no sensation in the injured area. Watch for injury to the skin from burns or scrapes. Watch for reddened areas from pressure sores. Watch for swelling and cholera changes due to circulation problems.
- Activity modification will vary from child to child. This will be addressed in Part 4 in depth.
- Any child who uses crutches can perform many activities if sitting in a wheelchair which frees up the use of their hands.

PART 3

CREATING AN ACCEPTING ENVIRONMENT

TOWARDS A LEAST RESTRICTIVE ENVIRONMENT: A CONTINUUM OF PARTICIPATION

Much attention and debate has centered on the concept of mainstreaming within the school system. This concept of mainstreaming has been defined as:

> **... providing individuals with handicapping conditions opportunities for appropriate Education, Physical Education, Recreation, and Sport Services and Activities as near to the traditional as possible.**
>
> **(Stein, 1985)**

The phrase "as near to the traditional as possible" bears a very important message. That is, individuals who are disabled should, whenever possible, participate in an integrated setting. Yet, there will be times when this is not entirely feasible. It is most important for the environment to be supportive of the needs of the individual. The student must be exposed to the environment which is least restrictive to his or her needs in the physical activity domain. In order for this to occur teachers must recognize the necessary interaction between the student and the environment. Specifically two areas must be addressed:

1. The school environment must be accepting if a child is to be successfully integrated into it. An accepting environment involves not only a physical environment which enables the disabled student to move with ease but also one in which he or she is accepted by other students and teachers. It is important to work towards acceptance by all.

2. The student who is disabled must be placed in an environment within which it is possible to cope, achieve and acquire physical, cognitive, social and emotional skills.

Mainstreaming requires much thought so that the needs of both disabled and non-disabled are met. Table 2 provides further clarification of this concept.

TABLE 2: An Interpretation of Mainstreaming

Mainstreaming is:

1. A step-by-step process.
2. Based on the needs, interests and capabilities of the individual.
3. The provision of necessary direct and support services as needed on an individual basis, which promotes independence, and to the extent possible, is based on the individual's choice.
4. A range/continuum of segregated, quasi-integrated, and fully integrated services.
5. Concerned with each individual whether mildly, moderately, severely, or profoundly disabled.
6. A process that impacts on non-disabled and disabled persons alike and significantly affects participants, staff, facility usage, and other critical elements of the system.
7. Based on the belief that people are, by far, more alike than different, and that individual characteristics, in and of themselves, are neither normal or abnormal.

The above information highlights the importance of ensuring that a continuum of opportunities is available to the individual. How can this be done in the physical education setting? Dunn and Craft (1985) identify a continuum of options which should be available to students

to allow them to participate in physical education in the least restrictive setting (see Figure 2).

Figure 2: A continuum for participation in physical education

1.Regular Physical Education
2. Regular Physical Education and Consultative Assistance
3. Regular Physical Education with Assistance
4. Regular Physical Education plus Part-Time Special Classes
5. Full-Time Special Class
6. Full-Time Special School

Where each individual student is placed within this continuum will depend on both the environment and the student. The physical education teacher is responsible for the first 3 steps on an ongoing basis, and may be responsible for any of the others depending upon teaching assignments.

This continuum should exist in all school systems. It is up to both the teachers and parents of students with special needs to lobby for such opportunities if they do not exist. If such a continuum is not available, the needs of the students will certainly fall between the cracks.

CREATING ACCEPTANCE IN MAINSTREAMED SETTINGS.

There are often visible as well as invisible barriers that must be overcome if programs and activities are to be totally accessible to individuals who are disabled. In this section consideration will be given to three aspects of an accepting environment: 1. the accepting teacher 2. the accepting peer/student 3. the accepting facility.

The Accepting Teacher

The leaders' attitude towards individuals within their classes who are disabled is a crucial element of an accepting environment. Their willingness to make the necessary alterations to activities, equipment, and materials will play a key role in creating a PRO handicapped

environment. The following are key points for teachers to consider in attempting to create an accepting environment:

Four Characteristics of Environments that are ANTI Handicapped

1. Non-handicapped individuals retain most, if not all, positions of important decision-making power (POWER).
2. Non-handicapped individuals maintain formal (and sometimes informal) policies and practices which discourage handicapped individuals' access to many school and community resources (RESOURCES).
3. Non-handicapped individuals assume the superiority of their norms and values and are frequently insensitive to alternative appearances, lifestyles, etc. (VALUES).
4. Non-handicapped individuals typically misplace "the problem" by making certain that attention is focused critically, or paternalistically, on handicapped individuals and not on themselves (OWNERSHIP OF THE PROBLEM).

Four Characteristics of Environment that are PRO Handicapped.

1. Individuals, handicapped and non-handicapped, share all positions of important decision-making power, especially the power over self-determination (POWER).
2. Individuals, handicapped and non-handicapped, maintain formal policies and practices which encourage handicapped individuals' access to all schools and community resources (RESOURCES).
3. Individuals, handicapped and non-handicapped, value pluralistic standards and norms and are sensitive to alternative lifestyles, appearances, etc. (VALUES).
4. Individuals, handicapped and non-handicapped, view "the problem" as "ours', 'mine", rather than "theirs" (OWNERSHIP).

(Taken from Bullock, Wohl, Webreck and Crawford,1982. Used with permission.)

The Accepting Student

Creating peer acceptance is a process which must often be undertaken purposefully if mainstreaming is to be successful. There is some debate whether students should be told in advance that a child who is disabled will be coming into their class. Some factors which may influence a teacher's decision one way or the other are:

- the number of handicapped individuals to be integrated
- the nature of the handicapping condition (degree of functional ability)
- the obviousness of the handicapping condition
- the age of the peer group (the younger they are the less important it may be to tell them before hand). If the decision is made to ready the students for the mainstreaming process, some helpful ideas may be:
  - simulate some handicapping conditions while participating in physical activity, e.g., playing tag while blindfolded, playing volleyball while sitting in chairs, etc.
  - hold a problem-solving discussion, e.g., "What if you were blind? How would you ride a bike, or play hopscotch?"
  - teach specific skills, e.g., simple sign language, guiding skills, manoeuvering a wheelchair.
  - have the student who is disabled visit the class the term before entry to meet his/her peers; possibly identify those students who are willing to interact with the student who is disabled so that on the first day of class a buddy system can easily be established.
  - invite a guest speaker, e.g., an adult who is blind and active in physical activity, or a wheelchair basketball player.

It is important at this time not to forget the needs of the student who is disabled. He or she too will need to be prepared for the mainstreaming process.

- Meet with the student and his/her parents to discuss what kinds of modifications can be made. Identify what will happen during a typical gym class so that the student knows what to expect, e.g., change room policies, rules in the gym etc.

- Consider whether the disabled child's physical activity skills warrants additional instruction outside of the integrated setting. Consideration of the continuum identified by Dunn and Craft (1985) is very important at this stage.

The Accepting Environment

An accepting environment for a child who is disabled means eliminating a host of barriers which often exist in the school setting yet often go unnoticed. Two of the more notable barriers are:

Architectural barriers

Many design and construction features of buildings and facilities cause problems for people with physical impairments. Although building codes have been amended recently to insure that new buildings do not create barriers for individuals who are disabled, these codes do not necessarily apply to older schools. It is important for teachers to recognize aspects of the gymnasium and building in general which may hamper a student from using the facility independently.

Ecological barriers

Physical obstacles that occur in the natural environment may be termed ecological barriers. Hills, trees, sand, rain, snow, and wind are just a few examples. Though these barriers may well be less frustrating for individuals who are disabled because they are natural phenomena, they are no less important. The physical education teacher needs to understand how these barriers may affect these students and try to be creative in solving the problem. Careful advanced planning is often enough to rectify any problems. For example, selecting an access route to a picnic area free of roots and large gullies.

It is important for teachers to be aware that there are barriers which can inhibit students who are disabled from participating in physical activity programs. Often this awareness will ensure that barriers become less of an issue.

PART 4

TEACHING TIPS FOR WORKING WITH STUDENTS WITH SPECIAL NEEDS

If mainstreaming is to be effectively implemented within the school setting, teachers must be prepared to adapt their teaching methods to meet the needs of individuals who are disabled. Students with special needs will require extra support in order for them to learn the skills which other non-disabled students pick up quite easily. The following sections will provide some "tips" on how physical education teachers can create positive learning environments for students with special needs.

ASSESSMENT

It is important to recognize that many students enter a mainstreamed setting who do not possess all of the basic motor skills required. Because basic motor skills are the foundation of any good physical education program, it is essential that all students, despite the developmental lag they may have, be given opportunities to become proficient movers. For this reason, it is essential to assess the students' motor abilities carefully.

The first step to consider in identifying the basic motor skills of a particular student is to conduct an informal assessment of the student's present skills. A simple checklist can be developed to this end.

Child's Name	Run	Catch	Kick	Throw	Strike
Susan	●	●	●	●	
John	●		●	●	●
Mary	●		●		
Robert	●				
Billy			●		

The ● mark indicates that the student is able to perform the skill listed in the activities being used in the physical education program. This informal assessment is helpful in:

- deciding the students' entry level,
- assisting the teacher to develop some short-term and long-term goals for the student,
- diagnosing the need for a more formal assessment.

The advantage of an informal assessment is that it is not time consuming, yet it can provide the teacher with a starting point for new students within their class. It may become evident to the teacher, however, that more information is required in order to set up an appropriate remedial skills program. This will be discussed in Part 5.

INSTRUCTIONAL TECHNIQUES

An understanding of some basic instructional techniques will assist the physical education teacher in ensuring that his or her students gain the skill necessary for participating in whatever activities they may choose. The method in which learning material is presented to students plays a critical role in the acquisition of skills and, equally important, the rate at which this learning takes place.

Task Analysis

Task analysis involves dividing a complex skill into simpler components, and then developing progressions which will enable the learner to master the components. Why is it necessary to break a skill into subskills?

1. **It makes the learning task easier for the student, thus increasing the probability of success;**
2. **It allows the teacher to assess a student's level and place him/her at a certain program level to begin instruction;**
3. **It gives the teacher explicit direction in determining skill content through structure and order.**

(Wehman,1977,p.)

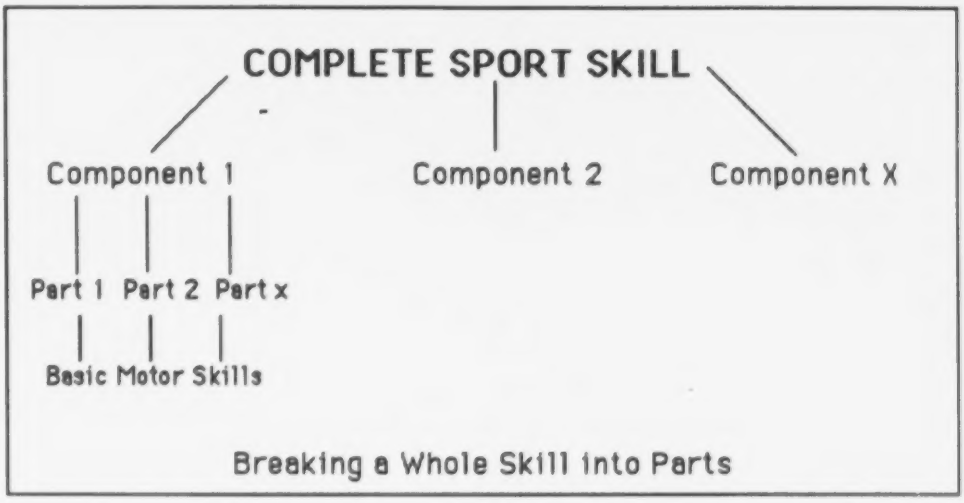
In order to understand the process of task analysis one needs to identify the steps within it first.

Task Analysis Steps

Following are the steps which a teacher should follow in teaching a new sport skill:

1. Identify the components within the skill.
   - As can be seen in Figure 1, a skill can be broken down into subcomponents. These subcomponents can also be broken down. If this process is continued, the teacher will find that any sport skill consists of a number of basic motor skills.
   - After this first step the teacher may also find that some basic motor skills are themselves a combination of simpler basic motor skills (see Figure 3).

Figure 3: Breaking a whole skill into parts



2. Organize the identified components into the order in which you will teach them. This is accomplished by identifying which components are:
   - the simplest
   - prerequisite to further components

   Some skills will be best taught starting at the beginning of the skills: other skills are best taught starting at the last step of the skill, or even the middle step.
3. Teach each component of the progression, or verify that the student can already execute the component.
4. Have the student perform the components of the skill in serial order, the order which you have identified.
5. Identify the successes and failures that the student has at each stage. This will allow further instruction to focus on the student's areas of difficulty.

There are many manuals and textbooks which provide examples of major sports skills and motor skills that are already task analyzed. References for these can be found in the bibliography at the back. It will at times be necessary for the teacher to analyze a skill which is not as common in order for a student to learn that skill.

Behavioral Teaching Principles

Task analysis is usually introduced in conjunction with behavioral teaching principles. The principles of shaping and chaining, and prompting and fading allow the teacher to use the principles of task analysis most efficiently.

Shaping and Chaining

The procedure of shaping can be utilized very effectively in conjunction with task analysis by physical education teachers. With shaping, the desired skill performance is achieved by reinforcing small steps or approximations toward execution of the desired skill rather than reinforcing only the desired skill itself.

- Shaping is particularly useful when teaching new skills. Reinforcement can be given to the student when he/she achieves approximations of the desired skill performance. As the skill performance becomes more accurate, reinforcement is given only for the correct response and previously reinforced approximations are ignored.
- When teaching students with special needs this can be particularly useful. Students often take a longer period of time to master new skills. By utilizing the shaping procedure, a teacher can ensure that the student is rewarded for performance at earlier intervals than the end, so that he or she does not become discouraged because of continuous failure.
- When a teacher identifies a progression of approximate steps a student should follow to achieve the final desired skill performance, this progression is called a chain.

  The most commonly used chain in teaching physical activity skills is a *backward chain* . With the backward chain, the last step in the sequence is the desired skill performance. Most skills can be task analyzed in such a way that the child can be guided through a chain from the most simple aspect of the skill to the final, most complex aspect of the skill, the "whole" skill.
- Consider the example of backward chaining example for the running long jump appearing in Figure 4:

Figure 4: An example of a Backwards Chain: The Running Long Jump

5. Run to the take-off board, one foot take-off, land on two feet, fall forward.
4. Three steps to take-off board, one foot take-off, land on feet, fall forward.
3. Jump from take-off board from one foot stance, two foot landing, fall forward.
2. Jump from edge of pit from one foot stance, land on two feet, fall forward.
1. Jump from edge of pit from one foot stance, land on two feet.

- This model might very well be used to teach a child who is mentally handicapped how to execute the running long jump. As the student approximates each of the steps in the backwards chain, he or she receives positive reinforcement.

Prompting and Fading

Two behavioral teaching tools which have been used extensively in teaching students who are mentally handicapped are prompting and fading. These techniques can, however, be equally useful in teaching other students with varying abilities.

Teachers will be faced with students who do not comprehend instructions, or do not listen to instructions. When this occurs, the teacher must determine how to have the student perform the desired skill or behavior.

One technique which may be useful is called *prompting*. There are three types of prompting.

1. *Verbal Prompting* - Verbal prompting or instruction involves verbal cues to inform the student of the behavior the teacher wishes exhibited. Instructions should be kept clear and simple.

2. *Visual Prompting* - Visual prompting is used in conjunction with verbal prompting. First the desired behavior or skill should be clearly demonstrated and then, if necessary, parts of the skill should be demonstrated and instructed (Task Analysis).

3. *Physical Guidance/Prompting* - Physical prompting involves the teacher's physical guidance of the athlete through the desired motions.

Hints on using prompting:

- Allow enough time for the student to respond, regardless of the type of prompt used.
- Use the least amount of prompting as is necessary to encourage the desired behavior or skill. Thus, always consider using verbal prompts before either visual or physical prompts.
- Be sure when using the physical prompt that you also reinforce the student's movement as he or she is being physically guided through it so that the student understands when the desired movement is being executed.

Fading refers to the gradual removal of the prompts being used by the teacher to motivate the student to perform a skill. Timing the removal of prompts is an art which teachers learn through experience. Removal of the existing prompt too early will result in loss of the response, thus requiring the teacher to start over. Failure to fade a prompt may lead to the student's dependence on the prompt to execute a skill. This is not desirable since the goal is to have all students participate in physical activity on the basis of their own initiative, rather than that of the teacher. This is certainly desirable for those students who are participating in a mainstreamed physical education setting.

Teachers may find that they can fade from physical to verbal to no prompts rather than moving backwards through the entire prompt continuum.

ACTIVITY ANALYSIS

Activity analysis is a systematic method of examining a specific activity to determine the physical, mental, and social capabilities required for participating in that activity. Once these are identified they can be compared to the functional abilities of students in specific physical education classes to determine the appropriateness of the activity for them. Such analysis will also provide direction for the modification or adaptation of an activity for individuals with limitations (Bullock and Palmer, 1985). Activity analysis may be done in a formal sense, by attending to the following format:

ACTIVITY ANALYSIS FORM

1. Activity name:
2. Purpose:
3. Equipment:
4. Rules:
5. Physical requirements:
6. Mental requirements:
7. Social requirements:
8. Necessary adaptation or modification:

It should also become part of any teacher's ongoing lesson planning process, so that consideration of the special needs of students becomes integrated into the teaching process.

- Some of the physical requirements to consider:
  - primary body position required (standing, sitting, kneeling, etc.)
  - types of movement required (bending, stretching, walking, running, grasping, throwing, hitting, skipping, etc.)
  - primary senses required (touch, taste, sight, hearing, etc.)
  - levels of the following required: strength, speed, endurance, flexibility, agility, coordination, etc.
  - parts of the body involved (top half, bottom half, arms, legs, head, hands, feet, eyes, neck, etc.)
- Some of the mental requirements to consider:
  - complexity of the rules
  - extent to which long- term memory is necessary
  - necessity for strategy
  - extent to which verbalization is necessary
  - extent to which concentration is necessary
  - extent to which it is necessary for students to identify forms, shapes, colors, sizes, numbers, body parts, etc.
  - directional modes required (left/right, up/down, around, over/under, etc.)
- Some of the social requirements to consider:
  - need for cooperation among individuals
  - necessity for a leader
  - level of activity structure
  - types of interaction required (verbal, non-verbal, etc.)

The activity analysis is not to be used as a menu, but rather as a guide. There may be other factors which have not been touched on that are equally important.

ACTIVITY MODIFICATION/ADAPTATION

Any activity can be adapted! After an activity analysis has been completed, the need to modify an activity for any individual will become apparent. Some general suggestions for activity adaptations are:

1. Base modification of the activity on individual's functional strengths/weaknesses rather than on diagnostic categories.
2. Suit adaptations to the abilities rather than the disabilities.
3. Modify games or rules when necessary to meet the needs of the group/individual.
4. Try not to change a game to such a degree that it becomes unrecognizable to other players.
5. Try these general ways to adapt games and sports:
   - Reduce the size of the playing area.
   - Use lighter equipment.
   - Slow down moving objects.
   - Modify the rules.
   - Provide additional rest periods.

It is beyond the scope of this document to provide an exhaustive list of ideas for modifying activities to meet the needs of individuals with disabilities. The following selected activities detail a variety of considerations to allow participants with various disabilities the opportunity to be active. It is hoped that the ideas will provoke creative activity analysis and modification.

Aquatics

This area of programming is not used as frequently in school settings as gym activities are. Research supports the value of swimming and pool activities for students with special needs. An aquatic environment, perhaps more than any other, allows those with physical disabilities to counter the problems they have dealing with locomotion and gravity.

Some observations regarding the benefits of aquatics are:

- Warm water is essential for students with orthopedic handicapping conditions (approximately 32° C).
- Swimming is excellent for the student with behavioral disorders because the warm temperature is relaxing and often provides a sedative effect.
- Therapeutic exercise under water is especially good for nonambulatory student.
- Amputees can become excellent swimmers.

Specific Adaptations

Visually Impaired

1. The visually impaired person must be completely oriented to the facility.
2. If demonstration is going on, an advanced participant or aid can do the actual demonstration while the teacher kinesthetically moves the visually impaired participant through the skill.
3. The pool should be roped off so that the deep and the shallow end are separated.
4. Audible goal locators or any audible device to signal the approach of the ends of the pool may be helpful.

Physically Disabled

1. Before the first session in the pool, any problem relating to getting in and out of the pool should be resolved. The participant should learn to get in and out of the pool without assistance even though this may be time consuming.
2. An aid may be required in the pool until the participant is independent in the water.
3. The use of fins or flippers for amputees may be advantageous.
4. Flotation devices may be used with individuals who lack buoyancy.
5. The stroke being taught should be modified to suit the functional ability of the participant; e.g., one arm involvement: teach modified side stroke, with legs providing most of the power and one arm pulling.

Dance

Dance can be adapted easily for individuals with a variety of special needs. The program can include most types of dance, such as creative dance, contemporary dance, square dance, folk dance and modern dance.

General considerations

- It may be necessary for the teacher to work with crutches or a wheelchair to obtain first-hand experience before working with the student who has ambulation difficulties.
- Directions and explanations should be kept simple so that the students can understand them.
- Colors, arrows, markers, color cues numbers and letters may be used on the floor for directions and positions in dances.
- Dance has been identified as being an excellent medium for individuals with the following disabilities:
  - Hearing Impairments: dance for these students, because they may feel the vibrations with their feet, can increase their verbal vocabulary by "dancing the words", and may develop the use of residual hearing.
  - Visual Impairments: dance may help these students improve auditory and tactile senses.
  - Autism: Dance has been identified as a good medium for teachers to interact with students who are autistic.

Specific Adaptations:

Visually Impaired

1. The leader must provide verbal instructions and cues for movement.
2. The visually impaired student may be placed with a seeing partner who assists initially.
3. In dances where clapping is introduced, clapping shall begin slowly--a few students at a time--so that the visually impaired student does not become confused.
4. Visually impaired participants must stay close by a sighted participant during group dances.
5. Music with a strong beat should be used.

6. There should be plenty of room for visually impaired students to move to music and explore the entire room.
7. Manual guidance and movement of body parts can be provided by other participants.

Hearing Impaired

1. The music should consist of low base sounds to obtain more defined vibrations.
2. The leader should face the student when speaking.
3. Signals should be established for specific movements; for example, pointing forward means sliding forward.
4. Hand clapping and hand movements will help the student to develop a sense of timing.

Physically Disabled

1. Students who are very weak and incapable of voluntary movements should be assisted physically, e.g., by moving their arms for them.
2. Students who are capable of walking without aids, but who experience balance problems, should be instructed to be careful when stepping backwards. They should be allowed to use wheelchairs for this activity unless they can be assisted effectively by an aide.
3. Slow motion movement to music is particularly suitable for these students.
4. Students in wheelchairs practice turning to music, with or without assistance, depending on their physical strength.

Individual and Group Games/Sports

Games, if handled correctly in particular situations with appropriate modifications, can provide many opportunities for students to learn, cooperate, achieve success, accept failure gracefully, take turns, share and, most importantly, have fun. Games may be highly organized with specific goals in mind or less organized with more emphasis on creativity. Games may also be more or less competitive.

The type of games which will suit students with special needs will vary dramatically. It is most beneficial for students to know a variety of games and activities in which they can participate alone or in groups. This knowledge will ensure that the students will be able to participate in physical activity during their leisure time.

Wall (1983) suggests that students who are physically awkward may benefit most from participating in individual activities. He suggests that the games students play in groups become more and more complex as students grow older. Those students who are physically awkward have greater difficulty with such games and tend to fail a great deal. This failure can have harmful effects on their self-esteem. As a result they tend to participate less and less in physical activity. If these students participate more in individual activities, where they are competing against themselves, they may experience a greater feeling of satisfaction and be less likely to see themselves as failures.

Wall's concept may well apply to students who are mentally handicapped. As they become more involved in mainstreamed physical education, they too will have difficulties participating in some group activities because of their developmental delay in motor skill acquisition. They may experience greater success in more individually oriented activities as well.

The above information highlights the need for the Physical Education curriculum to continue to focus on lifesport kinds of activities as students grow older.

The physical education teacher should not, however, disallow students who are disabled from participating in group activities. These types of activities can provide important opportunities for socialization. They must be aware of the need for both types of activities and be sensitive to the benefits of each. Awareness can be best achieved by analyzing the activity and the task to determine the suitability of a particular game or sport for a given individual.

Soccer

General Adaptations

- Permit substitution or interchange of duties when necessary.
- Limit play areas if movement capabilities are restricted.
- Shorten play periods if necessary.
- Assign positions according to individuals' capability levels.

Specific Adaptations

Visually Impaired

1. An audible goal locator placed near the goal will assist the visually impaired student in scoring.
2. Brightly colored balls or beeper balls can be utilized.
3. Initially the ball should be slightly larger and softer than a regular soccer ball to guard against injury.
4. Brightly colored line markers are useful.
5. Participants should only be allowed to shoot from a designated distance from the goal if a visually impaired person is goalie.
6. A buddy should work with the visually impaired student initially.

Physically Disabled

1. Individuals who are one or two arm amputees, or those who have only one leg, should have no difficulty participating in soccer. Whether they use crutches or a prosthesis, they will be best placed on defense.
2. Individuals who are confined to a wheelchair will have greater difficulty participating. Introducing a crab soccer game played on scooters is one sure way to involve them. Beyond this they may act as goalie if their skills in the chair permit or may do all of the throw in's for both teams.

Modifications Related to the K-12 Physical Education Curriculum

Students who are disabled can participate in any activity if the needed modifications are made. Such modifications depend to a great extent on imagination. The following are examples of activities taken from the K-12 curriculum which have been modified for students with various abilities.

Example 1: Kindergarten - Beep, Beep the Roadrunner (p. 87)

Goals/Objectives	Activity Suggestions
Walk	Children walk gym lines. When the children meet face to face, they call out "Beep-Beep", then change directions.

Adaptations

Blind. Use another student as a guide or set up a rope along the line. The other student who meets the blind student must touch him or her so that the person knows when to say "Beep-Beep".

Wheelchair. Choose two lines that can act as an alley. Students can either push themselves or have a buddy push them, or manoeuvre their electric chair.

Example 2: Grade 3 - ball work in Pairs (p. 148)

Goals/Objectives	Activity Suggestions
Kick and Trap	One child rolls the ball and the other practices various trapping techniques; e.g., under foot, inside foot, shin.

Adaptations

Blind. Use the beeping ball in order to allow the student to track the ball.

Autistic. Use task analysis and backwards chaining to teach the skill of trapping. The goal is to have the student initiate trapping on his or her own. An aide or parent could work with the student while other students are working on the same task.

Example 3: Grade 7 - Basketball (p. 238)

Goals/Objectives	Activity Suggestions
Project an object.	passing; throwing; shooting

Adaptations

One leg amputee (uses crutches). Have the student use a wheelchair. Use a junior size ball if shooting is too difficult with the heavier ball. *Muscular Dystrophy.* Have student work with a nurf ball on a simple skill to determine if the strength necessary to execute basketball skills is present.

Example 4: Senior High - Personal Fitness Program

Goals/Objectives	Activity Suggestions
Construct and use a physical fitness program	Select activities which best develop personal fitness level.

Adaptations

Because the activity is centered on the individual, the teacher can help the disabled student select activities which best suit personal abilities, yet provide challenge.

Ideas on Class Management

Mainstreaming is a desirable process. At the same time, however, it is also important to recognize the need for various class management techniques and supports to ensure that this process is workable. Following are some suggestions to this end.

One-to-One Instruction

It is desirable to mainstream students into physical education classes for the benefits of socialization and modeling. This does not mean that students should not receive more specialized instruction at times. Students with special needs will often not have developed the motor skills to take part in all activities. They require some one-to-one or small-group instruction so that they may eventually participate in all activities. How can you achieve this?

1. While more competitive activities are going on, have an aide work on the student's weak areas in a small area of the gym. If you do not have an aide, have students take turns working with the student who is disabled, or have parents come in at various times during the week to assist.
2. Time table special sessions once or twice a week for students in need. At this time you can ask parents or high-school students taking P.E. leadership courses to assist. In this way, a number of students can be brought in to a miniature motor development lab where they can improve skills that they might not have an opportunity to work on in a mainstreamed setting.
3. Offer classes after school for those students who need extra assistance. It is a common occurrence for students having difficulty in math or English, and it should be just as common for those students having difficulty in physical education.

Grouping the Class

Teachers in the classroom setting have recognized for years the need to group students by ability so that students can work at their own pace and level. This must occur in the gymnasium.

- Students must be grouped by functional ability. With the help of an aide, parent, or older student two or three activities can go on in a class at the same time.

- Stations can offer many skill challenges to a variety of students. Each station can be listed on a card on the wall, and each card can list different levels of challenge so that students at the same station can be working at different skill levels. Programs such as the Winnipeg School Division #1 "Step-by-Step" have ready-made stations for teachers to use, as does the Canadian Special Olympics Level 1 Coaching Course.
- Buddy systems where a more skilled student works with a student with a special need frees the teacher to do other things. The job of a buddy can rotate amongst all students, so that it does not become too onerous a task for any one student.

It is important to note that it is only as a last resort that teachers involve disabled students as time keepers or some other para role as a means of including them in an activity.

PART 5

RESOURCES

This resources section is intended to provide teachers with some tools which can be used when teaching students with special needs.

The first section provides examples of screening tests. Following these are some examples of evaluative instruments used on an ongoing basis to monitor students' progress. The second section provides examples of both referral forms and lists of types and suppliers for modified equipment. The last section lists the pertinent contacts within the community who can provide teachers with relevant information related to all aspects of adapted physical education.

SCREENING

To ensure that the student with special needs benefits from the physical education program, it is essential that the teacher make an appropriate assessment prior to determining program needs and modifications.

Three types of assessment instruments may be used in addition to general observation by the teacher:

- screening tests
- check-off lists
- evaluation instruments

Screening Tests

Denver Development Screening Test (DDST)--approximately 30 minutes--is used for students up to six years of age. Students perform various tasks appropriate to his/her age relating to:

- personal-social ability
- fine motor ability
- gross motor ability
- language ability

Check-Off Lists

Check-off lists are another approach to determining the student's developmental abilities and can be prepared by the teacher or taken from various published sources. The teacher observes the student in an activity and checks off whether or not he/she has a mature movement pattern for the skill or parts of that skill.

Winnipeg School Division #1 Basic Movement Skills Observation Profile provides a good example of a check-off list related to motor skill acquisition.

Sherill's Checklist for Evaluation of Walking (Sherrill, 1976)

Directions: Observe the student walking on several different terrains or surfaces (even or uneven), uphill, downhill, and on a level surface. Consider the eleven sets of alternate descriptions and check the one of each set that represents the student's level of performance. Until about age 4 most checks will be in the left-hand column. After age 4 the normal child exhibits mature walking. Use findings to write specific objectives.

Sherill's Checklist for Evaluation of Walking (Sherrill, 1976)

Check One	Development or Immature Walking	Check One	Mature Walking
	1. Forward lean a. from ground b. from waist and hips		1. Good body alignment
	2. Wide base of support with heels 5-8 inches from line of progression		2. Narrower base of support with heels 2-3 inches from line of progression
	3. Toes and knees pointed outward		3. Toes and knees pointed straight ahead
	4. Flat-footed gait		4. Heel-ball-toe transfer of weight
	5. Excessive flexion at knee and hip joints		5. Strong push-off from toes
	6. Uneven, jerky steps* *Jerkiness may be caused by a flat-footed or shuffle gait or by excessive stride length		6. Smooth and rhythmical shift of body weight with minimal up-and-down movement of body
	7. Little or no pelvic rotation until second or third year; body sways from side to side		7. Minimal rotatory action of pelvis (short persons will have more than tall ones)
	8. Rigidity of upper torso		8. Compensatory rotatory action of torso and shoulders inversely related to pelvic rotation
	9. Outstretched arms, also called high guard position		9. Arms swing freely and in opposition with legs
	10. Relatively short stride; 11-18 inch distance from heel to heel in pre-school children		10. Greater length of stride dependent upon length of leg. 25-26 inch distance from heel to heel in the average adult man
	11. Stabilization rate for walking at about 170 steps per minute		11. Rate of walking decreases to about 115-145 per minute

From Claudine Sherrill, Adapted Physical Education and Recreation: A Multidisciplinary Approach, 2nd ed. (Dubuque, IA; Wm. C. Brown, c 1976, 1981, 1986), p. 135. Reprinted with permission.

Evaluation Instruments

Once the student's needs have been identified either with the screening or checklists, he/she then should be evaluated by a team of specialists, including the physical educator.

Examples of Evaluation Tests:

1. Bruininks-Oseretsky Test of Motor Proficiency

2. Stott-Mayes-Henderson Test of Motor Impairment

Other tests of physical fitness, motor development and ability, and perceptual-motor development are recommended by Dr. Joseph Winnick. His analysis is listed below (Bundschuh, 1980). The Canada Fitness Awards, adapted version has been inserted for information.

Test	Components	Age and Population	General Area
AAHPER Special Test	Arm and Shoulder Girdle Strength Efficiency of Abdominal and Hip Flexor Muscles Speed and Agility Explosive Muscle Power Skill and Coordination Cardiovascular Efficiency	Mildly Retarded 8-18 yrs.	Physical Fitness
	Same elements as above plus: Height, Weight Bob Sitting and Reach, Hopping, Skipping, Target Throw and Tumbling Progression	Moderately Retarded 6-12 yrs.	Physical Fitness
AMP Index	Level of Awareness, Manipulation of Environment, Movement, Posture and Locomotion	Profoundly Retarded 2-1/2 - 17-1/2 years	Perceptual Motor Ability
Buell's Adaption of AAHPER Test for Blind	Same and AAHPER Special Fitness plus: strength, power and coordination.	Blind: 8 - 18 years	Physical Fitness

Test	Components	Age and Population	General Area
Canada Fitness Awards, Adapted Version	Muscular Strength Physical Fitness and Endurance, Flexibility Agility Cardiovascular Endurance	Trainable Mentally Handicapped 6-20 yrs.	Fitness
Note: Separate norms available for children with Down's Syndrome			
Cratty Six Category Gross Motor Test	Body Perception, Gross Agility, Balance, Locomotor Agility, Ball throwing and tracking	EMR (educable mentally retarded) 5 - 20 yrs. TMR (trainable mentally retarded) 5 - 24 yrs. Down's Syndrome 5 - 22 yrs.	Motor Development and Ability
Cratty Body Image Test for Blind	Body Planes Body Parts Body Movements Laterality Directionality	Blind: 8 - 19 yrs.	Perceptual Motor Ability
Denver Developmental Screening Test	Gross Motor Function Language Fine Motor-Adaptive Personal-Social	General Population 2 weeks - 6 yrs.	Perceptual Motor Ability
Frostig Developmental Test	Eye-Motor Coordination Figure-Ground Constancy of Shape Position in Space Spatial Relationships	General Population 4 - 8 yrs.	Perceptual Motor Ability
Godfrey-Kephard Checklist	Movement Patterns		Motor Development and Ability
Hayden Fitness Test	Strength & Endurance Power, Strength and Coordination Flexibility and Strength Flexibility, Strength, and Endurance Power Flexibility Organic Fitness	EMR: 8 - 17 yrs. TMR: 8 - 17 yrs.	Physical Fitness
Move, Grow, Learn Survey (Not standardized. Based on observation.)	Balance Coordination Strength Body Awareness Creative Movement Flexibility	General Population 6 yrs. old and up	Physical Fitness, Motor Development, Perceptual Motor Development

Test results seldom provide all the answers or understanding of the developmental abilities and limitations of the student. Through teacher observation, understanding of normal growth and development, and test results, we are able to make valid judgements of each student's needs. Once this is done, the program for the student can be developed.

FORMS

Forms

Before any fitness program begins, a referral form must be obtained from the family physician, attending specialist, or school medical personnel, with the diagnosis of the student's functional capacity or exercise tolerance level, an indication of areas of the body for which activity should be increased, minimized or eliminated, and recommendations for specific corrective exercises or remedial exercises.

This form enables the physician to provide diagnostic information about the condition and make general recommendations to establish the framework or limits of the program, and offers a prognosis about the individual and the condition. Physical education personnel are responsible for completing details of the program, choosing activities and determining appropriate methods.

Other forms which may be developed could be:

- a form letter to parents describing all procedures and inviting input from them;

- an individualized program form which outlines in specific detail the program strategies which may be best for each student, including objectives, program strategies, modifications, adaptation and evaluation.

MODIFIED EQUIPMENT

AQUATIC DEVICES

Schwimmflugel - Inflatable cuffs worn around each arm above the elbow to keep the nonswimmer afloat. Cost : $4.75. Available from Belleair International, 1016 Ponce de Leon Boulevard, Belleair, 33516.

Homemade alternative: Empty plastic bottles (capped) tied around arms with old nylon stockings or pieces of fabric are more cumbersome but less expensive to help beginners stay afloat.

Speedo Aqualift Swimsuit - A one-piece nylon tricot swimsuit constructed with an inflatable air bladder inside the front of the suit. When inflated, it will support up to a 200 pound adult and may be gradually deflated as the swimmer becomes more skilled and used to the water. Cost: $12.50, all sizes. Available from Blue Grass Industries, Carlisle, Kentucky 40311.

Homemade alternative: None known.

Aqua Bat - Water skis with tubing and a seal affixed for use by paraplegics, incomplete quadriplegics, amputees, and cerebral palsied persons. The tow rope may be held or tied to the tubing. The user steers the skis by leaning to either side. Cost: $104.50. Available from Gander Mountain, Inc., P.O. Box 248, Wilmot, Wisconsin 53192.

Homemade alternative: None known.

Bath Trolly - A plastic seat on four casters, resembling a gym scooter. The seat has a slightly curved backrest for stability and comfort and has slots cut into it to allow drainage of water. The trolly was designed to help leg amputees move from changing areas to pool or lakeside by propelling themselves with their arms. Cost: $61.00. Available from Orthopedia GmbH, D2300 Kiel 14, P.O. Box 6409 Germany.

Homemade Alternative: A gym scooter could be adapted by adding high quality casters and a backrest (optional). To construct a gym scooter, sand well and round off the corners of a piece of 12" x 12" x 3/4 inch plywood. Mount four casters with rubber wheels on the corners using wood screws. Paint the scooter with Marine paint or the less expensive Marine Spar varnish (2 coats). A gym scooter could alternatively be constructed of one of the many plastic materials now on the market.

BICYCLING EQUIPMENT

Spina Bifida Range Tricycles - Three-wheelers specifically designed so that persons of all ages who have no use of their legs can use hand propulsion to move the tricycle. Fixed gear drive from the rear axle results in bicycle pedals moving, thus exercising the rider's legs as well. Cost: $150.00-$200.00. Available from George Fitt Engineering, Tankerton Road, Whitstabel, Kent, England.

Special Pedals - These wood devices with leather heel supports and straps attach to the pedals of bicycles or tricycles to keep the user's feet from slipping off. Cost: $16.40 (7-,8-,9-inch sizes). Available from J.A. Preston Corporation, 71 Fifth Avenue, New York, N.Y. 10003.

Homemade alternative: Could be constructed by attaching a 3/4 inch wide leather strap around one end of a seven to nine inch piece of wood, securing another piece of leather at the heel for support; securely attach this to each bicycle pedal.

Buddy Bar - An attachment that joins two regular bicycles side-by-side approximately one yard apart, permitting visually handicapped, mentally retarded, or physically impaired persons to ride beside non-handicapped partners. Cost: $40.00. Available from Funway, 13930 Stansbury, Detroit, Michigan 48227.

Homemade alternative: Join a piece of metal tubing securely to the frame of each bicycle below the handlebars.

DEVICES FOR BALL ACTIVITIES

Adjustable Batting Tee - Can be raised to any height from 27 inches to 43 inches accommodating batters with a wide range of ages and heights. This enables individuals with poor coordination or visual impairment to practice batting skills and participate in softball or baseball games. Price includes telescoping tee, base, and plastic ball. Cost: $4.50. Available from Flaghouse, Inc., 18 West 18th Street, New York, N.Y. 10011.

Homemade alternative: Cut out the top end of a wiffle-ball bat and slip the bat through the end of a traffic cone. Or, cut a piece of 3/4 inch plywood into a two x two foot square, anchor a two to three foot tall pole or dowel (1-1/2 to 2 inches diameter) into the base with nails or screws. Attach a piece of hose with an adjustable clamp to the pole, which can then be raised or lowered according to height of children participating.

Hot Shot Automatic Billiard Cue - A billiard cue that is springloaded by pressing the tip against any available surface. Persons with amputations, cerebral palsy, muscular dystrophy, or high-level spinal cord injuries need only lightly press the trigger to fire the cue. Cost: $34.95. Available from A to Z Industries, 118112-5 Bryand Street, Northridge, California 91324.

Homemade alternative: None known.

Rug Croquet - Identical to a regular croquet game, except that wickers stand on little feet. This game is ideal for bringing a physical activity to youngsters who cannot go outside. Cost: $5.50. Available from Creative Playthings, Princeton, New Jersey 08540.

Homemade alternative: Make stands for regular croquet wickets by drilling a small hole in blocks of wood and inserting the ends of wickets into the holes.

BOWLING AIDS

Handle Grip Bowling Ball - A regulation bowling ball with a handle that automatically retracts flush into the ball when released; individual finger strength and dexterity are not required to use this ball. Cost: $52.50. Available from North American Recreation, P.O. Box 758, 33 Knowlton Street, Bridgewater, Connecticut 06601.

Homemade alternative: None known.

Bowling Ball Holder Ring - A ring attached to the arm of a wheelchair holds a bowling ball securely in the bowler's lap while he/she wheels up to the foul line. Cost: $9.99. Available from George H. Snyder, 5809 N.E. 21st Avenue, Fort Lauderdale, Florida 33308.

Homemade alternative: Any piece of metal (heavier than a coathanger) bent in a circle and clamped to the wheelchair arm will do.

Bowling Booster - A fiberglass portable ramp for use by persons who cannot move their arms to propel a bowling ball in the conventional manner. Ball can be propelled down the ramp using the feet, hands, arms, or other body parts. Cost: $47.50. Available from Russell Bechtel, 6943 Bittersweet, Pensacola, Florida 32506.

Homemade alternative: A wooden ramp with sides could be constructed, but it would not be this portable, lightweight and friction-free.

Bowling Ball Pusher - A long-handled rake-like device to aid persons who cannot bend and throw a bowling ball but are too mobile to require a bowling ramp. Cost: $39.95. Available from North American Recreation, P.O. Box 758, 33 Knowlton Street, Bridgewater, Connecticut 06601.

Homemade alternative: A pushbroom could be used; or the end of an old bristle-less pushbroom could be covered with foam and felt (so that the bowling lane is not damaged). A device similar to a shuffleboard pusher but with a larger head would be idea.

SKATING

The Skate Aid - A pyramidal device similar to a walker with runners, giving support to novice ice skaters. Cost: $59.95. Available from Hein-A-Kien, P.O. Box 56, Thief River Falls, Minnesota 567011.

Homemade alternative: Some ice skating programs use chairs, but these are not as safe and stable as the above device.

SNOW SKIING

Flipski - An outrigger ski for amputees, the tip of which flips up into the vertical position when the skier needs to use it as a crutch for walking. Outrigger skis resembling ski poles with little skis on the end are used instead of ski poles by amputee and other physically handicapped skiers to assist in balancing. Cost: $118.00. Available from Pauls Sports, Inc., Route 1, Box 615P, Elcelsior, Minnesota 55331.

NOTE: Prices are subject to change.
These are merely examples of some types of commercially available (and some homemade alternatives) adaptive devices and modified equipment.

MODIFIED EQUIPMENT RESOURCES

To find other commercially available adaptive or modified equipment, contact ABLE DATA. This is a data base which can provide you with a list of devices/equipment, manufacturers, suppliers and costs. This service is either free or is quite inexpensive. The address and telephone numbers are:

Marian G. Hall, System Manager
The ABLE DATA SYSTEM

National Rehabilitation Information Center
4407 Eighth Street, N.E.
Washington, DC 20017

Voice: (202) 635-6090
TDD: (202) 635-5884

The source is the most inclusive, but the names and addresses of a few suppliers are listed below.

ADAPTIVE EQUIPMENT AND MATERIALS SUPPLIERS

American Foundation of the Blind
15 West 16th Street
New York, NY 10011

Catalogue: Aids and Appliances for the Blind and Visually Impaired

Flaghouse, Inc.
18 West 18th Street
New York, NY 10011
(212) 898-9700

Catalogue: Wholesale catalogue of physical education and recreation equipment for exceptional and elementary children (K through 6), wholesale catalogue of adaptive, corrective, developmental, perceptual motor and recreation equipment for exceptional children and adults.

The Garcia Corporation
329 Alfred Avenue
Teaneck, NJ 07666
(Fishing gear for handicapped)

Hand Right (Perceptual Motor Therapy)
Motor Skills Research, Inc.
712 Inverness Drive
Horsham, PA 19044

Jack Golden Associates
16475 Stricker
East Detroit, MI 48021
(313) 772-4117

Catalogue: Blue Valley Industries, Inc., Form Incorporated Sculpture for Play, Exerglide Playground Division

Jennings Park-Playground School Equipment
P.O. Box 208
Litchfield, MI 49502
(517) 542-2916

Catalogue: Recreation Equipment for Disabled

Lind Climber Co.
109 Little Mellody Lane
Lake Forest, IL 60045
(312) 328-3488

Catalogue: Suggested Activities for the Climber

Newtoys, Inc.
3271 N. Cramer Street
Milwaukee, WI 53211
(414) 962-6400

Catalogue: Newtoys Catalogue

North American Recreation Convertibles, Inc.
P.O. Box 758
33 Knowlton Street
Bridgeport, CI 06601
(230) 336-2151

Catalogue Number 200, 201-S

Playground Corporation of America
29-24 40th Avenue
Long Island City, NY 11101
(212) 784-7070

Catalogue: Rehabilitative Play Equipment for Special Education and Play and Learn Products

Publications Office
Inst. of Rehabilitation Medicine
400 East 34th Street
New York, NY 10017

Listing of commercial sources of adaptive equipment

Recreation Equipment, Inc.
Your Outdoor Co-op
1525 11th Avenue
Seattle, WA 98122

Scimedics, Inc.
16220 Gundry Avenue
Paramount, CA 90723
(213) 34-5405

Pool cue for handicapped

Skill Development Equipment Co.
1340 North Jefferson
Anaheim, CA 92807
(714) 525-8752

Catalogue: Development with Skill Equipment

Snitz Manufacturing Co.
2096 S. Church Street
East Troy, WI 53120
(414) 642-3991

Catalogue: Integration through Normalization

Things from Bell
Box 26
30 North Main Street
Homer, NY 13077
(607) 479-4626

Catalogue: Equipment for the Total Physical Education Program

Tough Turner Company
1808 10th Avenue
Seattle, WA 98102

(Self-help recreation aids)

ADDITIONAL RESOURCES FOR HOMEMADE EQUIPMENT AND ADAPTED DEVICES

Corbin, Charles B. Inexpensive Equipment for Games, Play and Physical Activity. Dubuque, IA: Wm. C. Brown Company, 1972.

Physical Education and Recreation for the Handicapped: Information and Research Utilization Centre (IRUC). Homemade Innovative Play Equipment for Activities in Physical Education and Recreation for Impaired, Disabled, and Handicapped Participants. Washington, D.C.: AAHPER/IRUC, 1973, 92 pp.

COMMUNITY CONTACTS

Manitoba Sport Federation
1700 Ellice Avenue
Winnipeg, Manitoba

Manitoba Cerebral Palsy Sports Association	985-4210
Manitoba Deaf Sports Association	985-4210
Manitoba Special Olympics (Fitness, recreation and sport for people who are mentally handicapped)	985-4230
Manitoba Wheelchair Sports Association	985-4063
Manitoba Riding for the Disabled 7210 Roblin Blvd. Winnipeg, Manitoba	895-9438

Canadian National Association for the Blind Manitoba Division - Recreation Dept. 1080 Portage Avenue Winnipeg, Manitoba	774-5421
Society for Manitobans with Disabilities Youth Programs 825 Sherbrook Street Winnipeg, Manitoba	786-5601
Canadian Red Cross Association Manitoba Division Adapted Aquatics 226 Osborne Street North Winnipeg, Manitoba	772-2553
City of Winnipeg Parks and Recreation Department Regional Services Adapted and Special Services 2799 Roblin Blvd. Winnipeg, Manitoba	986-3838
Kiwanis Centre of the Deaf 285 Pembina Highway Winnipeg, Manitoba	284-0802
Michael Mahon Faculty of Physical Education and Recreation Studies University of Manitoba	474-8514

PART 6

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